CORNING GLASS WORKS
CORNING
RALEIGH, NORTH CAROLINA

ELECTRONIC RESEARCH LABORATORY

3800 ELECTRONICS DRIVE
TEL: 919 828-0511

July 30, 1968

Dear [redacted] STAT

Re: Rear-Projection Screen Program

Nearly half a year has elapsed since the submission of our proposal entitled "Reducing to Practice Certain Discoveries Relating to the Optical Phenomena of Rear Projection Screens".

During this time some further work on discrete particle scattering screens for Corning applications has been accomplished. We have changed the scattering particles to ground glass with some loss of resolution but with an easement of fabrication difficulties. Sample screens with separate absorbing and scattering layers have also been fabricated but not measured. Also during this time a lenticular configuration offering good performance and a solution to some manufacturing difficulties has been conceived.

Lenticular screens offer good light efficiency, low reflectance (important for preserving input contrast) and tailored viewing angles simultaneously. Optimum scattering screens trade off viewing angle against ambient light reflection and efficiency within relatively well determined limits. For these reasons we propose that the main emphasis of the current program be on lenticular screens.

One lenticular scheme meriting theoretical and practical investigation is based upon crossed cylindrical lenses to form lenticular elements. The cylindrical lenses can be made very small by re-draw techniques. Masking can be incorporated into the cylinders so that the mask is in registration with the lenticules. Practical investigations are essential to determine the character, extent and solution of the fabrication difficulties to be encountered.

Lenticular screens offer relatively precise control of projector light spreading which, ideally, should be exploited. For example, the top of a large vertical screen should spread light generally downwards whereas the bottom of the screen should spread light generally upwards. Thus, tailoring of light spreading from different areas of the screen can result in higher screen brightness or reduced projector power as compared with a conventional screen. The system studies proposed in our proposal are an important contribution towards screen optimization. Data and references supplied by Dr. Vincent reinforce the need for system studies, particularly if screen parameters are to be evaluated in terms of physiological significance.

Assuming success in design and fabrication of large lenticular screens a relatively long time may be needed to fabricate a sample.

Some work on scattering screens should be performed, as per our proposal, to investigate substrate darkening and to improve discrete particle screens.

Reduction of surface reflections is important for all rear-projection screens. In the course of work on Corning projects in the last half year, several facilities, in existence and planned, for coating large substrates have been brought to our attention. One firm has a cold coating process that may be usable on scattering screens, thus a ready-made solution to the reduction of surface reflections may already exist.

Based on the above considerations it is proposed that the major effort of the current program should be devoted to the achievement of a lenticular screen design. A revised proposed schedule is attached.

Very truly yours,

CORNING GLASS WORKS

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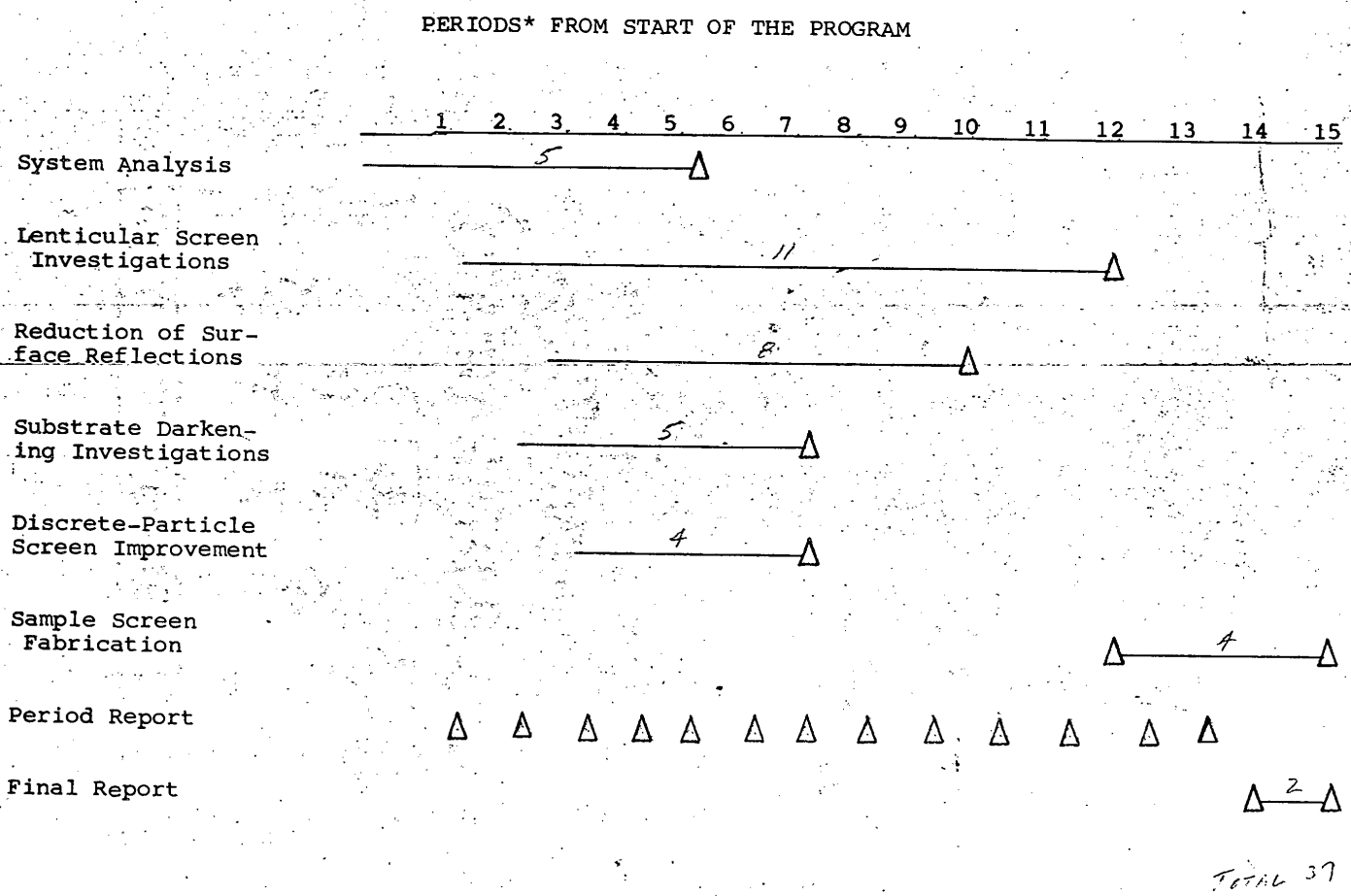
Electro-Optics Department

GRM:bao

Encl.



*1 Period equals 4 weeks.